IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: David W. Burns

Application No. 10/710,854

Filed: August 8, 2004

Confirmation No. 4853

For: STYLUS-BASED COMPUTER INPUT SYSTEM

Examiner: Regina Liang

Art Unit: 2629

Attorney Docket No. DWB002

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APPEAL BRIEF

Dear Commissioner,

The Applicant submits this Appeal Brief under 37 C.F.R § 41.37 to the Board of Patent Appeals and Interferences to appeal the decision of the Examiner of Group Art Unit 2629 dated October 31, 2006, finally rejecting claims 1-40 of U.S. Patent Application No. 10/710,854. Appropriate appeal fees and fees for an oral hearing are included. The Office received the corresponding notice of appeal on January 22, 2007.

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I. Real Party in Interest

The real party in interest is David W. Burns, who is also the inventor, applicant and authorized agent.

II. Related Appeals and Interferences

No other appeals or interferences are known at this time to the Applicant or the Applicant's legal representative, which will directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

While not relating directly to this Appeal, the Applicant desires to disclose to the BPAI the existence of related, co-pending applications listed in Table 1 below.

Table 1. Co-Pending Related Applications

Item	Title	Inventor	Status
0	Stylus-Based Computer Input System	D. W. Burns	U.S. Application 10/710,854 filed 8/8/04; Published as US 2006/0028457 on 9 Feb 2006 (subject of this appeal)
1	Stylus-Based Computer Input System	D. W. Burns	PCT Application No. PCT/US2005/027453 filed 8/2/05, based on U.S. Utility Application 10/710,854 filed 8/8/04; Published as WO 2006/020462 on 23 Feb 2006
2	Stylus-Based Computer Input System	D. W. Burns	EP national-stage filing based on PCT Application No. PCT/US2005/027453 filed 8/2/05, based on U.S. Utility Application 10/710,854 filed 8/8/04; Published as WO 2006/020462 on 23 Feb 2006
3	Stylus-Based Computer Input System	D. W. Burns	IN national-stage filing based on PCT Application No. PCT/US2005/027453 filed 8/2/05, based on U.S. Utility Application 10/710,854 filed 8/8/04; Published as WO 2006/020462 on 23 Feb 2006
4	Telemetric Imager	D. W. Burns	U.S. Application No. 11/161,383 filed 8/2/05, based on U.S Provisional Application 60/522,094 filed 8/15/04; Unpublished
5	Stylus Position Detection Algorithm	D. W. Burns	U.S. Application No. 11/161,384 filed 8/2/05, based on U.S Provisional Application 60/522,095 filed 8/15/04; Unpublished
6	Stylus-Based Computer Mouse Emulation	D. W. Burns	U.S. Application No. 11/161,385 filed 8/2/05, based on U.S Provisional Application 60/522,096 filed 8/15/04; Unpublished

7	Drawing Pad with Telemetric Imager	D. W. Burns	U.S. Application No. 11/161,386 filed 8/2/05, based on U.S Provisional Application 60/522,097 filed 8/15/04; Unpublished
8	Touchscreen with Telemetric Imager	D. W. Burns	U.S. Application No. 11/161,387 filed 8/2/05, based on U.S Provisional Application 60/522,098 filed 8/15/04; Unpublished
9	Electronic Whiteboard with Telemetric Imager	D. W. Burns	U.S. Application No. 11/161,388 filed 8/2/05, based on U.S Provisional Application 60/522,099 filed 8/15/04; Unpublished
10	Mobile Computing Device with Telemetric Imager	D. W. Burns	U.S. Application No. 11/161,389 filed 8/2/05, based on U.S Provisional Application 60/522,100 filed 8/15/04; Unpublished
11	Integrated Telemetric Imager	D. W. Burns	U.S. Application No. 11/161,390 filed 8/2/05, based on U.S Provisional Application 60/522,101 filed 8/15/04; Unpublished
12	Stylus for a Computer Input System	D. W. Burns	U.S. Application No. 11/161,392 filed 8/2/05, based on U.S Provisional Application 60/522,102 filed 8/15/04; Unpublished
13	Stylus Sleeve with Imaging Target	D. W. Burns	U.S. Application No. 11/161,393 filed 8/2/05, based on U.S Provisional Application 60/522,103 filed 8/15/04; Unpublished

III. Status of Claims

Claims 1-40 are currently pending in the application. All pending claims stand rejected as of the office action mailed on 10/31/06. The rejections of currently pending claims 1-40 are being appealed. These pending claims are listed in the Claims Appendix (Section VIII). A panel decision from a pre-appeal brief review of this matter, mailed 2/9/07, continues to reject all claims 1-40 except for claims 14, 24 and 33, which are objected to. The panel decision states that the application remains under appeal because there is at least one actual issue for appeal.

Prosecution History

When the amendment of 9/21/06 was filed and before the latest office action of 10/31/06, claims 1-40 were pending in the application. Of these claims, claims 2-10, 15-17, 19, 21, 22, 25-30, 34-39 remain original; claims 1, 11-14, 18, 20, 23, 24, and 31-33 were amended; claim 40 was previously added; and no claims were cancelled.

When the application was filed initially on 8/8/04, claims 1-39 were pending and all were original. As of the first, non-final office action mailed 1/18/06, all claims 1-39

were pending and all claims 1-39 were rejected. As of the response on 1/30/06 to the first, non-final rejection mailed on 1/18/06, all claims 1-39 were pending and all claims 1-39 were original. As of the second, final office action mailed 3/20/06, all claims 1-39 were pending and all claims 1-39 were finally rejected. In response, the Applicant and his spouse traveled cross-country and engaged in an in-person interview with the Examiner in the Examiner's office on 5/30/06.

In an attempt to reach agreeable resolution with the Examiner, an RCE was filed on 6/7/06 with an amendment in which claims 1-39 were pending and claims 1, 20 and 31 were modified to indicate a "single" telemetric imager, while the rest were original. As of the first, non-final office action (mailed 7/20/06) following the RCE, claims 1-39 were pending in the application and claims 1-39 were rejected. A telephonic interview was held between the Examiner and the Applicant on 9/5/06, and an interview summary was mailed on 9/8/06. As of the response on 9/21/06, claims 1-40 were pending of which claims 1, 11-14, 18, 20, 23, 24 and 31-33 were amended, claim 40 was added, the remaining claims were original, and no claims were cancelled as indicated above. These were all finally rejected in the office action of 10/31/06.

In addition to an objection by the Examiner to currently pending claim 32, eleven grounds of rejection are held against claims 1-40, and all eleven grounds of rejection are being appealed. The eleven grounds of rejection to be reviewed on appeal are found in Section VI.

A Pre-Appeal Brief Request for Review per the OG Notice of 12 July 2005 was submitted with the corresponding Notice of Appeal on 1/21/07 and received by the Office on 1/22/07. A pre-appeal brief conference was held, and the Notice of Panel Decision for Pre-Appeal Brief Review, mailed 2/9/07, indicates approval to proceed to the Board of Patent Appeals and Interferences because there is at least one actual issue for appeal. The panel determined that all claims 1-40 continue to be rejected except for claims 14, 24 and 33 that are objected to. A brief telephone conversation with the Examiner indicated that dependent claims 14, 24 and 33, if combined with their respective independent claims 1, 20 and 31, might be allowable. While the Applicant appreciates the timely panel review, the essential issues with respect to independent claims 1, 20, 31, and all dependent claims thereto have not been addressed satisfactorily and the Applicant appeals to the BPAI.

Statement of Preferred Claims

Provided that the Board of Patent Appeals and Interferences agrees with the arguments contained herein and reverses the Examiner's rejections on all points, the Applicant prefers that the Examiner be directed to accept all claims 1-39 as originally filed (listed for convenience in Section XI, Listing of Claims as Originally Filed and as Currently Desired), along with additional paid-up claim 40.

IV. Status of Amendments

All amendments have been entered by the Examiner and are reflected in the listing of the claims shown in Section VIII, Claims Appendix (note that a listing of the original claims is shown in Section XI). No claims have been amended subsequent to final rejection after the RCE.

V. Summary of Claimed Subject Matter

The claimed subject matter relates generally to computer input devices, and more specifically to hardware and software for stylus and mouse input systems. With reference to Fig. 1 of Burns (reproduced below for convenience) and the published specification (Burns, U.S. Pub. 2006/0028457, paragraphs 48-57), the claimed subject matter includes a system for determining a stylus position 12 of a stylus 20. The system includes a telemetric imager 30 and a controller 40 electrically coupled to the telemetric imager. The controller determines the stylus position based on a generated image of a stylus tip 18 from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region 50. Also claimed are a method and a system for determining the position of the stylus.

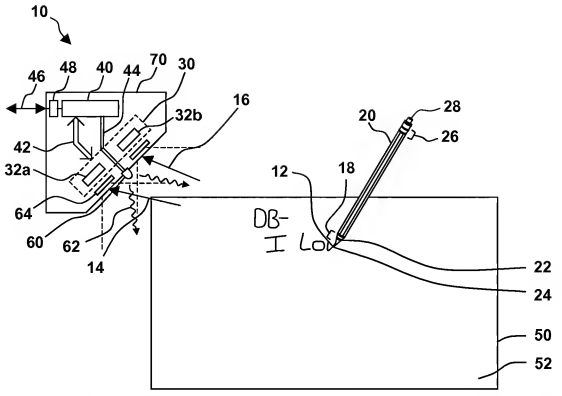

Fig. V-1. Fig. 1 of Burns, reproduced here for convenience (U.S. App. 10/710,854; also published as U.S. Pub. 2006/0028457).

Some of the recent advances in machine-vision technology relate indirectly to this invention and are illustrative of technology based on generated images and image processing. For example, a synthesized yellow line is generated and superimposed on television video to indicate the first-and-ten line of American football. In another example, television video-camera systems can identify and highlight on a viewing screen a specific vehicle that is in a fast-moving and closely spaced line of thirty or more NASCAR racing cars. In another example, cameras systems allow security personnel to zero in on an individual and follow that person moving through Las Vegas casinos or an international airport. These three approaches are based on generated images and image processing to follow a characteristic feature and then to augment a viewing screen with additional graphics that can add or highlight desired features or avoid certain features. For example, the system synthesizing the first-and-ten yellow line is able to avoid extending the yellow line over the top of the image of the bodies of players.

Regarding computer input devices, we are familiar with many of the conventional input devices such as the trackball, the optical mouse, the capacitive or resistive touch screens on our laptops and in signature verification pads at grocery and convenient stores, light pens, graphics tablets and even styli with on-board cameras to detect codes printed on special paper for storing script. However, to the current knowledge of the Applicant, no one has developed or commercialized a machine-vision mouse.

The invention of Burns, unlike the inventions of the cited art, is essentially a compact machine-vision system with two imaging arrays (or one with special optics) comparable to that of high-resolution web cameras, configured to view and recognize a three-dimensional object such as a stylus tip. The images taken of the stylus tip are processed to determine the position and other properties of the stylus. The resulting determination can be used, for example, to move a pointer on a computer screen, to enter script such as a person's signature, or to emulate mouse functions such as a click and a double-click with equivalent tapping motions of the stylus. As aids for recognizing the stylus, imaging targets may be placed on one or both ends to differentiate writing and erasing modes, to determine the angle of the stylus with respect to the stylus entry region, or to determine rotation about the central axis of the stylus for calligraphy, symbols and languages where the stroke direction and width are relevant. A light source such as an LED may be located near the telemetric imager to illuminate the stylus when ambient lighting is insufficient, or to aid in stylus location determination by flashing on and off so that consecutive images can be subtracted from each other to mitigate the effects of background lighting.

An advantage and distinction of the present invention from prior art and commercially available devices is that the stylus needs no active parts such as a battery, a switch, an RF chip, an LED, a laser diode, an on-board camera, coded paper, or a special pad to interface with. Even a simple, inexpensive lead pencil suffices, which also allows writing on paper or other medium while the tip position is tracked and information is entered into the computer. Another advantage and distinction of the present invention is the ability to detect the stylus position when it is above a coordinate plane, to detect hovering of the stylus tip before picking a selectable object, and to emulate other conventional computer mouse functions. A third advantage and distinction is the ability

to recognize imaging targets on the stylus such as writing-mode imaging targets or erasing-mode imaging targets. A fourth advantage and distinction is the lightness and form factor of the stylus that is much like that of a conventional pen or pencil, is rapidly moved, and is intricately controlled by the fine motor control muscles of the fingers and hand, rather than a person's hand splayed over a palm-sized mouse.

It is apparent to the Applicant of the continuing need for stylus-based computer entry devices. Fig. V-2 shows an example of an attempt to generate script using a conventional two-button optical mouse on a mouse pad, which in general lacks clarity, smoothness and repeatable characteristics that define a signature. Fig. V-3 is a screen shot of the USPTO Patent Commissioner's electronic signature taken from a published document regarding extension of the pilot pre-appeal brief conference program, and is indicative of electronic signatures occurring in many documents today with its loss of personality. Fig. V-4 shows a watermarked digital signature from another USPTO official that also lacks in personality. Other examples of low-resolution and less-than-satisfactory script input include the credit/debit card signature terminals at many department, grocery and convenience stores having a touch-pen with a cord to validate a customer's signature (not shown here). In a health-related example, individuals afflicted with carpal tunnel syndrome from extensive interaction with a conventional computer mouse may find that switching to a stylus-type mouse as in the present invention may ease their pain and allow healing. The approach of Burns works extremely well for contemporary web-based applications where an input device such as a finger or a stylus is used to select entries much more frequently than a keyboard is used to type words or commands. While a thumb or finger may suffice, the stylus tip provides the resolution to operate with contemporary small-screen mobile devices. Combined with the speed and dexterity of the human hand, the invention offers significant improvements over a contemporary optical mouse, while being able to emulate all of its capabilities including clicking, double-clicking, right-mouse button clicking and entry selection, and re-positioning and hovering of a mouse icon over a selection button on a display in accordance with predefined tapping and associated movements of the stylus tip.

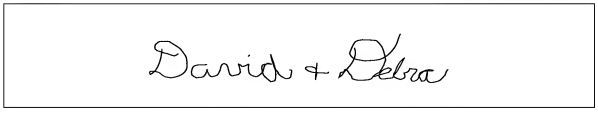

Fig. V-2. Sample of "script" writing using a conventional optical mouse on a mouse pad. Note the poor quality of the script characters with jagged, ragged edges and lack of smooth curves. The invention of Burns increases the fidelity of input script to allow signature quality.

Date: 1/10/2006

/s/
John Doll
Commissioner for Patents

Fig. V-3. Sample of an electronic signature from the Commissioner for Patents. Note the lack of script characters. The invention of Burns allows actual signatures to be input into a document with ease.

MEMORANDUM

August 10, 2005

TO: Vice Chief Administrative Patent Judge
Administrative Patent Judges

FROM: MICHAEL R. FLEMING
Chief Administrative Patent Judge

Michael Fleming

Digitally signed by Michael Fleming
DN: CN = Michael Fleming, C = US, O = Chief Judge, OU = BPAI
Date: 2005.08.11 17:08:46 -04'00'

SUBJECTS: Standard Operating Procedure 1 (Revision 12)
Assignment of judges to merits panels, motions panels, and expanded panels

Fig. V-4. Sample of an electronic signature from the Chief Administrative Patent Judge. Such signatures are a compromise due to conventional technology that lacks the ability to allow a person to rapidly and accurately insert script writing directly into a document.

1) Applicant Believes He is the First and True Inventor of the Claimed Invention

After five patent searches (one by the Applicant prior to filing and four by the Examiner including an International Search Report) and after reviewing very closely all the cited art brought up by the Examiner, the Applicant continues to believe that he is the first and sole inventor of this stylus-based computer input system. The Applicant has not seen his claimed invention in the marketplace, in any publication, or in any patent literature, and recognizes the continued market need for a hoverable, high-resolution, stylus-based computer input system for emulating mouse functions, providing script input for a computer, and for moving a mouse icon and selecting objects from a large or tiny computer screen. The Applicant believes that it would be incorrect to attribute this invention to Ricoh, Wacom, or any other owners of the issued patents cited by the Examiner, and is submitting this Appeal Brief to defend his position.

2) The Claimed Invention has Fewer Parts and Different Parts than Any Cited Art

The approach of Burns uses a telemetric imager having one or two optical imaging arrays, such as found in conventional cell phone cameras or digital cameras, and a controller that determines the stylus position from images of the stylus tip. No active components are required in the stylus.

The cited art, on the other hand, uses more parts and different parts than Burns such as a reflective or absorptive frame (Figs. 1 and 21 of Omura, U.S. Pat. 6,594,023 and Fig. 2 of Ogawa, U.S. Pat. 6,100,538), cylindrical lenses for collimating light (Fig. 5 of Omura and Fig. 2 of Ogawa), arrays of LEDs and light detectors on opposite sides of a frame (Fig. 7 of Omura), LEDs in the stylus (Fig. 8 of Omura and Fig. 5 of Ogawa), a rotating scanning system (Fig. 11 of Omura), an ultrasonic transducer on an input pen (Fig. 2 of Tsuji, U.S. Pub. 2001/0020936), a mercury switch in the stylus (Fig. 3 of Brown, U.S. Pat. 4,430,526), a pressure sensor, battery and switches in a pointing device (Fig. 3 of McDermott et al, U.S. Pat. 5,635,683), an optical motion sensor in a pen-like computer pointing device (Fig. 1 of Badyal et al, U.S. Pat. 6,151,015), a rotating detector and a retroreflecting strip in a framed area (Fig. 1 of Griffin, U.S. Pat. 4,553,842), among others.

3) The Claimed Invention Operates Differently than Any Cited Art

The invention of Burns essentially uses a 3-D imaging approach capable of determining the 3-D position of a stylus tip. Other stylus attributes such as an erasing end or a writing end, stylus angle with respect to the writing surface, and the stylus rotation about a longitudinal axis of the stylus may be determined from recognizable targets or features near the stylus tip.

The cited art detects an end of a stylus in a *thinly sliced planar region* on a coordinate plane by, for example, the interruption of light from special mirrors on a framed border (Fig. 1 of Omura and Fig. 1 of Griffin) or by the detection of light emitted from the stylus having an LED (Fig. 8 of Omura and Fig. 2 of Ogawa). Omura and Ogawa actually teach away from the invention of Burns, in that elements are included to intentionally limit the view field to a very small distance from the coordinate plane (Figs. 5 and 21a-21c of Omura and Figs. 2, 4, 7b, 15b, 15c, 17 and 22 of Ogawa). If this were not the case, then the system would erroneously provide x and y coordinates as output even if the stylus with the LED or the tip of a light-interrupting stylus were not on the coordinate surface.

None of the cited art uses a telemetric imager or generates images of a stylus tip. The approach of Burns determines, for example, the x, y and z position of the stylus tip, allowing the system to detect when a user wishes to simply move a mouse icon around a screen and when the user wishes to then make a selection by a rapid, downward stroke.

None of the cited art presents or claims the ability to detect imaging targets on the stylus. Cited methods that use light-interruption or light-detection when the stylus tip is on the surface do not, by default, determine characteristics of an imaging target positioned near the end of the stylus. The approach of Burns can determine, for example, when a user wishes to provide script input or remove previous markings simply by turning the stylus end-for-end. Similarly, the desired width of script features for calligraphy or Japanese kanji characters can be detected with special imaging targets traversing the circumference of the stylus tip that indicate the rotation of the stylus with respect to its long axis or the angle of the stylus with respect to the writing surface.

The method of Burns is different from that of any of the cited references, since the stylus position is determined based on images of the stylus tip.

4) Claim Rejections under 35 U.S.C. § 102(b) are Not Supported by the Cited Art

For a proper 102(b) rejection, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference" (MPEP § 2131). None of the cited art has a telemetric imager or a controller that determines the stylus position based on images of a stylus tip, as does Burns. Nor does the cited art determine the stylus position based on generated images.

5) A Rejection of Claims under 35 U.S.C. § 103(a) is Not Supported by the Cited Art

For a proper 103(a) rejection, 1) there must be some suggestion or motivation to modify or combine the references; 2) there must be a reasonable expectation of success; and 3) the prior art references must teach or suggest all the claim limitations (see MPEP § 2143). None of the cited references, singly or in combination, has a telemetric imager, nor does any one describe an invention that determines the stylus position based on images of a stylus tip. For example, there is no combination of any of the referenced inventions that can successfully detect a writing-mode imaging target or an erasing-mode imaging target on a lead-pencil stylus as in Burns (see Fig. V-1 above).

VI. Grounds of Rejection to be Reviewed on Appeal

The following grounds of rejection are to be reviewed on appeal:

A. The rejection of claims 31, 32, 38 and 39 under 35 U.S.C. § 102(b) as being anticipated by Omura et al (U.S. Pat. 6,594,023);

B. The rejection of claims 1, 2, 4, 6, 11-13, 15, 16, 18, 20, 21, 23, 26, 27, 29, 30, 35 and 36 under 35 U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) in view of Ogawa (U.S. Pat. 6,100,538);

C. The rejection of claim 37 under 35 U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) in view of Tsuji (U.S. Pub. 2001/0020936);

D. The rejection of claims 3, 8-10 and 28 under 35 U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538) as applied to claims 1 and 20, and further in view of Tsuji (U.S. Pub. 2001/0020936);

E. The rejection of claim 34 under 35 U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) in view of Brown et al (U.S. Pat. 4,430,526);

F. The rejection of claims 5 and 25 under 35 U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538) as applied to claims 1 and 20, and further in view of Brown (U.S. Pat. 4,430,526);

G. The rejection of claims 7 and 22 under 35 U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538) as applied to claims 1 and 20, and further in view of Inabata (U.S. Pat. 5,245,175);

H. The rejection of claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538) as applied to claim 1, and further in view of McCDermott et al (U.S. Pat. 5,635,683);

I. The rejection of claim 19 under U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538) as applied to claim 1, and further in view of Yoshida et al (U.S. Pat. 5,401,917);

J. The rejection of claims 14, 24 and 33 under 35 U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538) in view of Badyal et al (U.S. Pat. 6,151,015); and

K. The rejection of claim 40 under 35 U.S.C. § 103(a) as being unpatentable over Segen (U.S. Pat. 5,484,966) in view of Griffin (U.S. Pat. 4,533,842).

VII. Arguments

A. Omura Does Not Describe, Claim or Anticipate the Claimed Invention

Note: the claims associated with this ground of rejection do not stand or fall together, though if the Board insists that a single claim be selected for decision, please consider independent claim 31, as the other claims depend thereon.

Claims 31, 32, 38 and 39 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Omura et al (U.S. Pat. 6,594,023). The 102(b) rejection of claims 31, 32, 38 and 39 of Burns by the Examiner raises four questions. The first is whether Omura patented or described (anticipated) the invention of Burns so that Burns should be denied patent protection with the claim elements as listed in currently pending claim 31 (claim elements 1-4). The second is whether Omura patented or anticipated the invention of Burns even if a light source (claim element 1) is not included for illuminating the stylus tip. The third question is whether Omura warrants a 102(b) rejection of Burns when there is a *single* telemetric imager (claim element 2). The fourth question is whether the Examiner correctly rejected Burns based on U.S.C. § 102(b) in light of Ogawa (U.S. Pat. 6,100,538) as delineated in the first two office actions prior to the RCE with claim 31 as originally filed.

The Applicant contends that the answers to each of these questions is "no", and that all claims, whether in amended form as listed in Section VIII or in original form as listed in Section XI, should be allowed.

For a proper 102(b) rejection, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference" (see MPEP § 2131). The art of record fails to set forth each and every element in the claim.

Regarding the first question, Omura fails to show 1) means for illuminating a stylus tip with a light source when the stylus tip is in the stylus entry region; 2) means for generating an image of the stylus tip from a first direction with a single telemetric imager; 3) means for generating an image of the stylus tip from a second direction with the telemetric imager; or 4) means for determining the stylus position based on the

generated images from the first direction and the second direction when the stylus tip is in the stylus entry region, as in currently pending claim 31 of Burns.

The Examiner has interpreted Omura as having these four elements. In the Examiner's own words as to claims 31, 32 (final office action after RCE, mailed 10/31/06, page 2-3),

> Omura discloses a system (Fig. 8 for example) for determining a stylus (65) in a stylus entry region (66), comprising: *means for illuminating a stylus with a light source* when the stylus tip is in the stylus entry region (LED 64 is a light source and is at the tip end of the stylus); means for generating an image of the stylus from a first direction with a single telemetric imager (position detect part 62, CCD camera 63a generates an image of the stylus from a first direction); means for generating an image of the stylus tip from a second direction with the telemetric imager (position detect part 62, CCD camera 63b generates an image of the stylus from a second direction) and means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region (col. 14, line 45 to col. 16, line 23 for example) [italics added].

Regarding the first claim element of currently pending claim 31 of Burns, the Applicant believes that the Examiner is in error by construing that Omura has "means for illuminating a stylus with a light source when the stylus tip is in the stylus entry region". For convenience, Fig. 8 of Omura is reproduced below. The Applicant and the Examiner do agree that LED 64 is a light source and is at the tip end of the stylus of the invention of Omura. [The invention of Burns does not require a light located on the stylus.] The Applicant, however, disagrees with the Examiner that LED 64 is a "means for illuminating a stylus with a light source". The source of the confusion may be in an incorrect understanding of the word "illuminate". The sun, for example, illuminates both the earth and the moon. The sun is not illuminated; it radiates or emits light. In another example, one turns on a flashlight and illuminates a floor. The flashlight is not illuminated; it emits light. As written in Omura (col. 14, lines 55-58), "The coordinate inputting unit 65 is formed in a pen-like shape and has the infrared rays LED 64 at a tip end thereof so as to *irradiate* infrared rays from the infrared rays LED 64 upward" (emphasis added). In Omura, light irradiates out from the active inputting unit 65,

whereas in Burns, light is sent towards and illuminates the passive stylus 20. In short, Omura fails to show means for illuminating a stylus.

As described in Section V above, one advantage and distinction of the present invention from prior art and commercially available devices is that the stylus needs nothing active, such as a battery and an IR LED. The location of parts and the mode of operation is different between Omura and Burns, for at least the reason that Omura has an LED at the stylus tip whereas Burns illuminates the stylus with a light source positioned near the telemetric imager. Remarks regarding the other claim elements follow.

FIG. 8

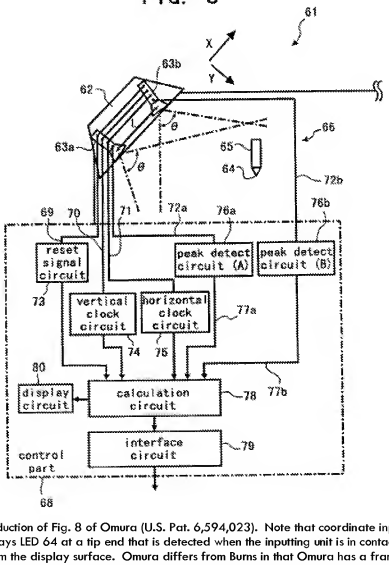

Fig. VII-1. Reproduction of Fig. 8 of Omura (U.S. Pat. 6,594,023). Note that coordinate inputting unit 65 has the infrared rays LED 64 at a tip end that is detected when the inputting unit is in contact with or a small distance from the display surface. Omura differs from Burns in that Omura has a frame, limits the view to a thinly sliced planar region essentially parallel to the display surface, uses an LED in the pen tip, does not generate images of the stylus tip, and is unable to tell the difference between a pencil end with one band and a pencil end with two bands, as can Burns.

Regarding the second and third claim elements of Burns, claim 31, the Applicant believes that the Examiner is in error by construing that Omura has "means for generating an image of the stylus from a first direction with a single telemetric imager and means for generating an image of the stylus tip from a second direction with the telemetric imager". The system of Omura with CCD camera 63a and CCD camera 63b of Omura does not determine the stylus position based on generated images of the stylus. While Fig. 8 of Omura may give this impression, important details can be gleamed from the associated text for Fig. 8 and with respect to Fig. 9 of Omura that teach away from Burns. Omura uses the light emitted from the LED to detect the brightest spot on the coordinate surface, as described with respect to Fig. 9 and the associated text (Omura, col. 15, line 49 to col. 16, line 24). A peak detect signal 77a generated by peak detect circuit 76a from image signal 72a corresponds to light emitted from infrared rays LED 64, and peak detect signal 77b generated by peak detect circuit 76b from image signal 72b also corresponds to light emitted from infrared rays LED 64 (see Omura, col. 15, lines 9-22 and 53-67). The peak-detection approach of Omura is not the same as the image-generation approach of Burns. For example, the peak-detection approach of Omura would not be able to identify imaging targets on one end or the other of a stylus as in Burns. Furthermore, the invention of Omura is based on light interruption by a stylus or light emission from a stylus in a thinly sliced planar region near a surface best described with reference to Figs. 21a-21c of Omura (reproduced below for convenience). The technical approaches of light-interruption or light-emission-in-a-plane that permeate the specification of Omura are illustrated with reference to Fig. 1, Fig. 2, Fig. 3, Fig. 4, Fig. 5, Fig. 7, Fig. 11, Fig. 12, Fig. 22, Fig. 23, other figures, and associated text of Omura. Omura is different from Burns in that Omura does not generate images of the stylus and does not determine the position of the stylus based on the images, as does Burns. For example, *Omura is unable to identify an imaging target on the stylus* such as a single band to indicate a writing mode or a double band to indicate an erasing mode. In another example, *Omura is unable to detect a stylus tip hovering over a surface*, a capability exceedingly important to moving a mouse icon on a computer screen before selecting it, for example, with a downward tap of the stylus as in Burns. Omura actually teaches away from Burns, in that the invention of Omura adds structural, optical or electronic elements to limit the view

field, and detection of a stylus tip only occurs in a limited view field above the coordinate plane. In contrast, Burns determines the stylus position based on generated images. If Omura did not limit the field of view, then the Omura system would erroneously provide x and y coordinates as output even if the stylus with the LED or the tip of a light-interrupting stylus were not on the coordinate surface. This detection of peak detect signals from a limited view field does not constitute generation of an image as in Burns. Omura fails to show means for generating an image of the stylus from a first direction with a single telemetric imager and means for generating an image of the stylus tip from a second direction with the telemetric imager.

FIG. 21A

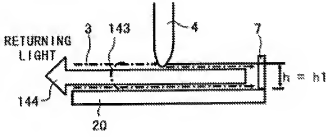

FIG. 21B

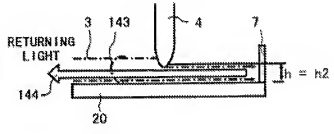

FIG. 21C

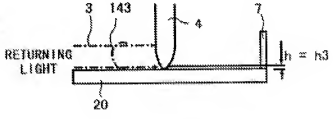

Fig. VII-2. A reproduction of Figs. 21a-21c of Omura (U.S. Pat. 6,594,023). Note that designating device 4 interrupts returning light 144 from reflective member 7 as the designating device approaches the display surface 20 (Omura, col. 25, lines 43-56). The designating device of Omura interrupts light to determine stylus position, whereas the approach of Burns uses images of the stylus tip to determine the stylus position.

Regarding the fourth claim element of Burns, claim 31, the Applicant believes that the Examiner is in error by construing that Omura has "means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region", since Omura does not generate images and therefore does not determine the stylus position based on generated images as does Burns.

The specification of Burns supplies multiple ways to determine the stylus position based on generated images. Determination of the stylus position may be made, for example, with the controller running code to capture output from the optical imaging arrays and to compute the x, y *and* z location of the stylus tip from telemetric formulas (see paragraph 68 of the published application). Another approach to stylus position determination is a pattern-recognition technique run on captured output from the optical imaging arrays (paragraph 68). Another approach to stylus position determination is made with a suitable model based on the stylus image information (paragraph 68). Pattern recognition or formulation techniques may be used to determine whether the stylus is in a writing mode or an erasing mode using, for example, a writing-mode imaging target placed near the writing end of a stylus or an erasing-mode imaging target placed near the erasing end of the stylus (paragraph 70). Pattern recognition can be used to recognize a predetermined tip shape or to locate and interpret a predetermined target on the stylus (paragraph 70). The angle of the stylus with respect to the stylus entry region may be determined with the aid of a stylus-angle imaging target (paragraph 71). Similarly, an angle of stylus rotation may be determined with the aid of stylus-rotation imaging targets (paragraph 71). A light source such as an LED near the telemetric imager can be modulated, and a comparison made between images with the light source on and off to determine the stylus position, even with significant amounts of ambient lighting (paragraph 61 and 86). A similar differentiation of the claim elements as given above was submitted to the Examiner with respect to 102(b) rejections over Ogawa (U.S. Pat. No. 6,100,538) in Section 1 of the Remarks included with the first office action response submitted on 1/30/06.

Still in regards to the first question of whether Omura patented or described (anticipated) the invention of Burns, an appropriate test for a proper 102(b) rejection

should be similar to that imposed by the first paragraph of 35 U.S.C. § 112: "The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same". *Evasive claim language* such as found in Omura should be held to the same standard as means plus function claim language, in that support for the evasive claim language needs to be found in the specification to give it any patentable weight, and that interpretations beyond what is described and enabled should be discounted. For example, the first claim of Omura includes claim elements such as a "coordinate determining device", a "distance determining device", a "storing device", a "coordinates change detecting/storing device", a distance change detecting/storing device", and a "state allocating device". For the "coordinate determining device", a quick Google™ search turned up 164 results of which only 27 were considered unique and all 27 related to patents. No on-line ads were delivered (this was refreshing) and no non-patent usages were referenced, indicating that a "coordinate determining device" does not have a plain meaning or even a trade meaning. Similar results were obtained with the other entries, most with even fewer hits (except for the "storing device"). Because of this, the definition of "coordinate determining device" must be found *within* the specification to determine the definitions and limits of the evasive terms. Such analysis does not support a 102(b) rejection of claim 31 of Burns for at least the reasons that neither Omura nor Ogawa have a telemetric imager, generate images of the stylus tip, or determine the stylus position based on the images.

For at least each of these reasons, Omura is an inappropriate reference for a 102(b) rejection. Omura fails to anticipate any of the claim elements, let alone each and every one for a proper 102(b) rejection. Omura does not describe, claim, anticipate, teach, show or suggest the claimed invention, and reversal of the Examiner's rejection of claim 31 and all dependent claims related thereto is requested.

The second question to answer is whether Omura patented or anticipated the invention of Burns even if a light source is not included for illuminating the stylus tip. Omura did not, for at least the reasons set forth above that were directed at "means for generating an image of the stylus tip from a first direction with a single telemetric

imager; means for generating an image of the stylus tip from a second direction with the telemetric imager; and means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region" as in currently pending claim 31. Because none of three forementioned claim elements is supported by Omura, a 102(b) rejection has been incorrectly asserted against Burns, and original claim 31 should be allowed.

The third question is whether the existence of Omura warrants a 102(b) rejection of Burns when Burns has a *single* telemetric imager. The applicant continues to consider the modifier "single" to be irrelevant, in that the telemetric imager as described in Burns generates images used by the controller to determine the position of the stylus (Fig. 1 in Burns). As described in paragraph 60 of Burns, "An exemplary configuration of telemetric imager 30 includes one or two optical imaging arrays and associated optics to generate the images of the stylus tip from two directions, allowing for the telemetric determination of the stylus position...." Consequently, the Applicant asserts that the language of claim 31 is proper as filed originally (listed in Section XI), and prefers that the language of original claim 31 be allowed. As per the record, the Applicant has continuously defended this point, as in the first office action response of 1/30/06 (no claims amended), as during the personal interview held at the USPTO on 5/30/06, as in the remarks (last paragraph on page 9) associated with the filing of the RCE on 6/7/06 where the claim was modified, and as in the remarks (also last paragraph on page 9) associated with the response on 9/21/06 to the first office action after the filing of the RCE.

The fourth question is whether the Examiner correctly rejected claim 31 and others of Burns based on U.S.C. § 102(b) in light of Ogawa (U.S. Pat. 6,100,538) as in the first two office actions mailed by the Examiner on 1/18/06 and 3/20/06 prior to the filing of the RCE. The Applicant asserts the answer is no, in that the claim elements as now or as originally filed are not patented, anticipated or described by Ogawa. Ogawa does not have "means for generating an image of the stylus tip from a first direction", "means for generating an image of the stylus tip from a second direction", or "means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region". The claim

language of Ogawa as well as Omura is evasive (for example, claim 1 of Ogawa has "detector means", "processor means", "collimator means", and "shield means"), and close inspection *must* be made of the specification to determine what the terms mean. After effort, one realizes that Ogawa, like Omura, determines the position of a pointing object by interrupting light with the stylus or by detecting light from the stylus tip when it is inserted into a thin region essentially parallel to the coordinate plane. Several figures characteristic of Ogawa (Fig. 2, Fig. 7b, Figs. 15b and 15c, Fig. 17 and Fig. 22) are provided below for convenience. For example, Fig. 2 of Ogawa shows one of two detecting units 3L, whereby "each of the detecting units 3L and 3R contains a *collimator lens* constituted by a lens group 9, which converges *only* a parallel component of the light projected from the stylus 2 that is substantially parallel to the coordinate plane 1 onto a light receiving surface of the *linear* image sensor 13...." (Ogawa, col. 7, lines 62-67, emphases added). In another example, Fig. 7b of Ogawa shows that light from a light source is collimated "to project the [illumination light] in a parallel manner along the coordinate plane" (Ogawa, col. 10, lines 19-20) to restrict the light to a narrow field of view. Fig. 15b and Fig. 15c show another example of a narrow view field, with detecting unit 3 detecting the color exposed by a tip of a spring-loaded stylus in the view field, where Fig. 15b "shows a state in which a relatively large writing pressure is applied to the stylus 2" and where Fig. 15c "shows a state in which a relatively small writing pressure is applied to the stylus 2" (Ogawa, col. 12, lines 62-65). Fig. 17 of Ogawa shows a detecting unit 3 with a lens 9 "mounted in the detecting unit 3 for limiting a view field 11 of the detecting unit 3 below a predetermined height relative to the coordinate plane 1 to make the range of receivable projected light parallel to the coordinate plane 1 (Ogawa, col. 13, lines 44-48). Fig. 22 shows another example of restricting the view field. Additionally, the Abstract of Ogawa indicates that part of the invention is to: "limit the view field of the detector below a predetermined height relative to the coordinate plane such that through the limited view field the detector can receive only a parallel component of the light which is projected from the pointing object substantially in parallel to the coordinate plane".

The apparatus of Ogawa used to limit the view field, to collimate light from a limited view field, to interrupt returning light or to provide a light source in the stylus

differs significantly from that of Burns, in that Burns uses a telemetric imager to generate images of the stylus tip and determines the stylus position based on the generated images. For example, Omura is unable to detect imaging targets such as a single band or a double band on a lead pencil as can Burns.

It is clear to the Applicant that the invention of Burns is not the same as Ogawa or Omura, having different elements and operating differently from Ogawa and Omura. Ogawa or Omura do not teach, show, suggest, describe, anticipate or claim the invention as claimed by Burns, and claim 31 as currently pending or as originally filed, as well as all other claims that depend thereon, should be allowed.

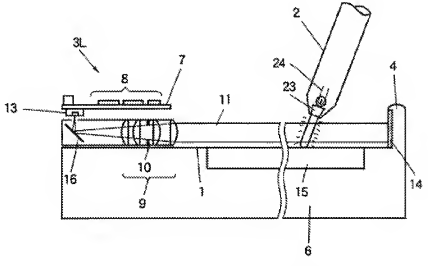

Fig. VII-3. Reproduction of Fig. 2 of Ogawa (U.S. Pat. 6,100,538). Light in a collimated view field 11 that is parallel to coordinate plane 1 is directed by wide-angle collimator lens group 9 from stylus 2 onto linear image sensor 13. Shield frame 4 encloses view field 11 to prevent extraneous light from entering into the detecting units 3L (shown) and 3R (not shown). Ogawa differs from Burns in that Ogawa has collimating optics, a restricted view field, and a light source in the stylus, whereas Burns does not. Nor does Ogawa generate images of the stylus or determine the stylus position based on the images as in Burns.

FIG.7 (b)

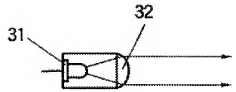

Fig. VII-4. Reproduction of Fig. 7b of Ogawa (U.S. Pat. 6,100,538). Light from light source 31 is collimated in the direction vertical to the coordinate plane and in a parallel manner along the coordinate plane by cylindrical lens 32. The light is collimated to restrict the illumination to a narrow field of view.

FIG.15 (b)

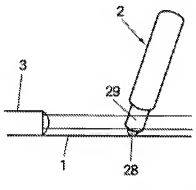

FIG.15 (c)

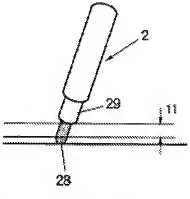

Fig. VII-5. Reproduction of Fig. 15b and 15c of Ogawa (U.S. Pat. 6,100,538). A stylus 2 with a colored, spring-loaded slide member 28 in the collimated view field 11 is hidden partially by cover member 29 based on stylus pressure.

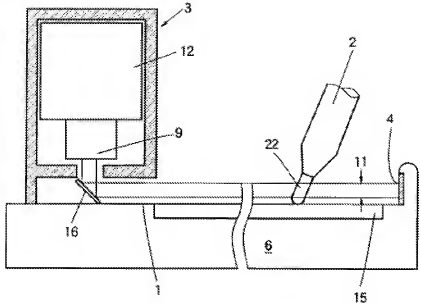

Fig. VII-6. Reproduction of Fig. 17 of Ogawa (U.S. Pat. 6,100,538). Detecting unit 3 receives projected light from tip portion 22 of stylus 2. Lens 9 limits the view field 11 of the detecting unit 3 below a predetermined height relative to the coordinate plane 1 (col. 13, lines 35-48).

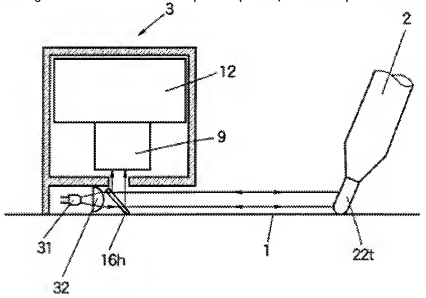

Fig. VII-7. Reproduction of Fig. 22 of Ogawa (U.S. Pat. 6,100,538). Light from light source 31 is collimated by cylindrical lens 32 to detect retroreflecting member 22t of stylus 2 when in a narrow region above coordinates plane 1. As described with respect to Fig. 17 of Omura, lens 9 is "mounted in the detecting unit 3 for limiting a view field 11 of the detecting unit 3 below a predetermined height relative to the coordinate plane 1 to make the range of receivable projected light parallel to the coordinate plane 1" (Omura col. 13, lines 44-48).

B. A Combination of Omura and Ogawa Does Not Teach, Show or Suggest the Claimed Invention

Note: the claims associated with this ground of rejection do not stand or fall together, though if the Board insists that particular claims be selected for decision, please consider independent claims 1 and 20, as the other claims depend thereon.

The question here is whether the Examiner was in error when rejecting claims 1, 2, 4, 6, 11-13, 15, 16, 18, 20, 21, 23, 26, 27, 29, 30, 35 and 36 under U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) in view of Ogawa (U.S. Pat. 6,100,538). The Applicant believes that the Examiner was in error, for at least three reasons. The first is that the inventions of Omura and Ogawa, while trying to solve some of the same problem as Burns (entry of data into a computer), do so in a significantly different way. The second is that the claim elements are different in the invention of Burns compared to those of either Omura or Ogawa. The third is that the claim elements are fewer in the invention of Burns compared to those of either Omura or Ogawa (as well as any combination of the two inventions). An invention that is simpler and has fewer elements may seem obvious and possibly covered by another invention with more complexity and a larger number of elements, though patent protection should not be denied to a simpler or seemingly less complex invention. It is possible that the Examiner believes that the invention of Burns is so straightforward and obvious that someone should have already patented it or described it earlier than Burns. It appears, however, that with all of the searching by the Examiner and by the Applicant, and with no evidence that the system is being commercially sold, that Burns may indeed be the first and sole inventor. On the question of obviousness, Judge Learned Hand said that

> "It certainly cannot be necessary to repeat the well-known principle that it is no indication of noninvention that the device should seem obvious after it has been discovered. Many great inventions are of this character, and the reason why the ordinary man does not discover them although they are so plain when someone else has done so is that habit has limited his power to see what he has not been accustomed to see, and his selective attention is fast bound by his past experience." Judge Learned Hand, *Hartford v. Moore*, 181 F 132 (S.D.N.Y. 1910).

The Applicant believes that neither Omura nor Ogawa nor anyone else has patented, taught, described, anticipated, shown or suggested the claimed invention, and that the Examiner is indeed in error on this issue.

For a proper 103(a) rejection, 1) there must be some suggestion or motivation to modify or combine the references; 2) there must be a reasonable expectation of success; and 3) the prior art references must teach or suggest all the claim limitations (see MPEP § 2143).

Regarding claim 1, the 35 U.S.C. § 103(a) rejection of the claim as being unpatentable over Omura in view of Ogawa is not believed to be appropriate by the Applicant. The combined teachings of the cited references do not suggest that the present invention is obvious, in that none of the references, singly or in combination, suggest or teach "a system for determining a stylus position comprising: a single telemetric imager having an optical imaging array, a light source positioned near the telemetric imager to illuminate a stylus tip, and a controller electrically coupled to the telemetric imager, wherein the controller determines the stylus position based on a generated image of the stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region", as in presently pending claim 1 of Burns.

Omura does not have a telemetric imager as does Burns. None of the embodiments of Omura has a telemetric imager; a telemetric imager is not found in any of the figures; and a telemetric imager is not claimed. The Examiner references Fig. 8 of Omura (reproduced as Fig. VII-1 above) as a telemetric imager. As argued above, neither CCD camera 63a nor CCD camera 63b of Omura generate images of the stylus for determining the stylus position based on the images. While Fig. 8 of Omura may give this impression, a close reading of the specification establishes that the invention of Omura is based on a stylus that will interrupt light or emanate radiation detectable when the stylus tip is inserted into a "two-dimensional coordinate inputting/detecting area 66 and is formed in a plane by the coordinate inputting/detecting member" (not shown, though described with respect to Fig. 7 as a rectangular shaped frame having an internal space serving as a coordinate inputting/detecting area 57 (see Omura, col. 14, lines 60-62 and col. 14, lines 29-31). The sliced planar approach is also illustrated with reference to

Fig. 1, Fig. 4, Fig. 5, Fig. 7, Fig. 11, Fig. 12, Figs. 21A-21C, Fig. 22, Fig. 23, other figures, and associated text. It is an error to construe that Omura "determines the stylus position based on a generated image of the stylus tip from a first direction and generated image of the stylus tip from a second direction when the stylus tip is in the stylus entry region" (Burns, claim 1), when Omura does not generate images.

The Examiner concedes in the most recent office action (mailed 10/31/06) that Omura does not disclose a light source positioned near the telemetric imager to illuminate a stylus tip, yet contends that Ogawa does teach such a light source. The light sources taught in Ogawa, while close to the detecting unit such as shown in Fig. 22 of Ogawa, includes a cylindrical lens 32 that narrows the light vertically to illuminate the stylus when the stylus is positioned in a limited view field or thinly sliced planar region near the coordinate plane (see arguments and figures in Section VII-A above). This type of light source is more complex and different from that of Burns, and is set to illuminate only a narrow region parallel to the coordinate plane. Ogawa further explains the manner and means of operation: "It should be noted that each of the detecting units 3L and 3R incorporates collimator means for limiting a view field of the detecting unit to a predetermined width and in the vertical direction from the coordinates plane 1 to make a range of receivable projected light parallel to the coordinates plane 1. Moreover, shield means in the form of a shield frame 4 is arranged to enclose a periphery of the coordinate plane 1, the shield frame 4 being wide enough in the vertical direction for blocking undesired noise light..." (Ogawa, col. 6, line 65 to col. 7, line 6).

Table 2 summarizes some of the key differences between Omura, Ogawa and Burns. The machine-vision approach of Burns is inventively and significantly different than that of Omura, Ogawa, or a combination of Omura and Ogawa.

Table 2. Essential Differences between Omura, Ogawa and Burns

Element	Omura	Ogawa	Burns	Comments
Imaging Approach	Light-interruption or light-emission in a plane	Light-interruption or light-emission in a plane	3-D	Omura and Ogawa are light-interrupting or light-emitting in a thinly sliced planar region parallel to the coordinate plane; Burns is machine-vision (3-D)
Telemetric Imager	None	None	Yes	Omura and Ogawa have light emitting/receiving devices, infrared rays position detecting part, collimators and detecting units; Burns generates images
Sensor and optical elements	Linear or 2-D with optics for limiting view field to detect light-interruption or light-emission in a plane	Linear or 2-D with optics for limiting view field to detect light-interruption or light-emission in a plane	Single 2-D imaging array with binocular optics or two 2-D imaging arrays within telemetric imager to generate images	Omura and Ogawa include optical elements such as cylindrical lenses, slits, mirrors on a frame bordering the coordinate plane, mirrors that rotate, shield frames and others to limit the view field; Burns uses imaging arrays as in cell-phone cameras or webcams to generate images.
Writing/Erasing Mode Targets	None	None	Taught and Claimed	Burns can use targets such as one or two bands on each end of stylus to indicate write and erase modes (Burns, para. 49)
Stylus Angle with Respect to Surface	No	No	Taught and Claimed	Burns can use special imaging targets on stylus; beneficial for calligraphy, stylized writing and symbol entry (Burns, para. 49)
Stylus Rotation with Respect to Long Axis of Stylus	No	No	Taught and Claimed	Burns can recognize special imaging targets on stylus for stylized writing (Burns, para. 49)
Height Determination Above Surface	No	No	Yes	Omura and Ogawa intentionally limit the view field to a parallel region; the imaging approach of Burns allows determination of tapping, writing or hovering; stylus entry region of Burns includes a real or virtual surface and region above the surface (Burns, para. 48)
Hover Detection	No	No	Yes	The approach of Burns allows a mouse icon to be moved as the stylus tip hovers above a surface, and a selection to be made with a downward tap.
Mouse Emulation	No	No	Yes	Omura and Ogawa require additional switches for mouse clicks; the approach of Burns allows mouse emulation by detecting stylus tip movements such as a tap or double-tap

Omura and Ogawa do not teach or suggest all the claim limitations as in presently pending claim 1 of Burns, no suggestion or motivation has been expressed to modify or combine the references for a proper 103(a) rejection, and there is no chance for technical success since any combination of Omura and Ogawa would not result in a telemetric imager that generates images and determines a stylus position based on the images as in Burns. Omura, in view of Ogawa, does not teach, show or suggest the claimed invention and for at least these reasons, reversal of the Examiner's rejection of claim 1 is requested.

For the same reasons, the Applicant requests that the Examiner's rejection of claim 1 in original form (see Section XI) also be reversed.

Regarding claims 2, 4, 6, 11- 13, 15, 16 and 18, while certain poignant differences of opinion occur between the Examiner and the Applicant, these claims depend on claim 1, and for at least the reasons given above for allowing claim 1, the rejections to these claims, in original or amended form, should be reversed as well.

Regarding claim 20, which is a method claim corresponding to apparatus claim 1, the 35 U.S.C. § 103(a) rejection of the claim as being unpatentable over Omura in view of Ogawa is not appropriate for at least the reasons set forth regarding claim 1 (see above). The combined teachings of the cited references do not suggest that the present invention is obvious, in that none of the references, singly or in combination, teach, suggest or show "a method of determining a stylus position comprising: positioning a stylus tip of a stylus in a stylus entry region; generating an image of the stylus tip from a first direction with a single telemetric imager; generating an image of the stylus tip from a second direction with the telemetric imager; and determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region [whether or not] the stylus tip of the stylus is illuminated by a light source positioned near the telemetric imager" (Burns, claim 20). The Applicant requests, for at least these reasons and the reasons presented above, that the Examiner's rejection of claim 20 be reversed.

For the same reasons, the Applicant requests that the Examiner's rejection of claim 20 in original form (see Section XI) also be reversed.

Regarding claims 21, 23, 26, 27, 29, 30, 35 and 36, these depend on independent claims 1, 20 or 31, and for at least the reasons presented above for allowing claims 1, 20

and 31, the rejections to claims 21, 23, 26, 27, 29, 30, 35 and 36, in original and amended form, should be reversed.

C. A Combination of Omura and Tsuji Does Not Teach, Show or Suggest the Claimed Invention

The Examiner has rejected claim 37 under U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) in view of Tsuji (U.S. Pub. 2001/0020936). The Applicant asserts that the Examiner is in error, because neither Omura nor Tsuji have "means for illuminating a stylus tip with a light source when the stylus tip is in the stylus entry region; means for generating an image of the stylus tip from a first direction with a single telemetric imager; means for generating an image of the stylus tip from a second direction with the telemetric imager; and means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region" as in currently pending claim 31 of Burns (Section VIII) or as in the original claim 31 of Burns (Section XI) (see arguments in Section VII-A and VII-B above). Since claim 37 of Burns is dependent on claim 31, then for at least the reasons cited in Section VII-A and VII-B above, the rejection by the Examiner should be reversed.

D. A Combination of Omura, Ogawa and Tsuji Does Not Teach, Show or Suggest the Claimed Invention

The Examiner has rejected claims 3, 8-10 and 28 under U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538) as applied to claims 1 and 20, and further in view of Tsuji (U.S. Pub. 2001/0020936). The Applicant believes that the Examiner is in error, because neither Omura nor Ogawa nor Tsuji have "a single telemetric imager having an optical imaging array; a light source positioned near the telemetric imager to illuminate a stylus tip; and a controller electrically coupled to the telemetric imager; wherein the controller determines the stylus

position based on a generated image of the stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region", as in currently pending claim 1 of Burns (Section VIII) or as in the original claim 1 of Burns (Section XI). Since claims 3 and 8-10 are dependent on claim 1 of Burns and that claim 28 is dependent on corresponding method claim 20 of Burns, then for at least the reasons cited in Section VII-A and Section VII-B above, the rejection by the Examiner should be reversed.

E. A Combination of Omura and Brown Does Not Teach, Show or Suggest the Claimed Invention

The Examiner has rejected claim 34 under U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) in view of Brown (U.S. Pat. 4,430,526). The Applicant holds that the Examiner is in error, because neither Omura nor Brown have "means for illuminating a stylus tip with a light source when the stylus tip is in the stylus entry region; means for generating an image of the stylus tip from a first direction with a single telemetric imager; means for generating an image of the stylus tip from a second direction with the telemetric imager; and means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region" as in currently pending claim 31 of Burns (Section VIII) or as in the original claim 31 of Burns (Section XI). Since claim 34 is dependent on claim 31 of Burns, then for at least the reasons cited in Section VII-A and Section VII-B above, the rejection by the Examiner should be reversed.

F. A Combination of Omura, Ogawa and Brown Does Not Teach, Show or Suggest the Claimed Invention

The Examiner has rejected claims 5 and 25 under U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538) as applied to claims 1 and 20 above, in further view of Brown (U.S. Pat. 4,430,526). The

Applicant disagrees with the Examiner, because neither Omura nor Ogawa nor Brown have "a single telemetric imager having an optical imaging array; a light source positioned near the telemetric imager to illuminate a stylus tip; and a controller electrically coupled to the telemetric imager; wherein the controller determines the stylus position based on a generated image of the stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region" as in currently pending claim 1 of Burns (Section VIII) or as in the original claim 1 of Burns (Section XI). Since claims 5 and 25 are dependent on claim 1 and corresponding method claim 20 of Burns, then for at least the reasons cited in Section VII-A, Section VII-B and Section VII-E above, the rejection by the Examiner should be reversed.

The Applicant objects to the Examiner's conclusion that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the stylus of Omura to have an erasing mode as taught by Brown so as to provide pointing device which is capable of performing writing and erasing operations". The invention of Brown includes a mercury switch (see Fig. VII-8), which would not be allowed with today's environmental standards. Furthermore, the mercury switch implies that one always writes downwards, although the writing mode or erasing mode determination means of Burns allows writing vertically or even upside down without confusion, such as on a whiteboard or while a user is inclined. Claims of obviousness and ordinary skill should be upheld in light of utility and engineering appropriateness, of which the Examiner upholds neither in this case. For example, it is difficult for the Applicant to imagine how a mercury switch could be construed as an imaging target.

FIG. 3

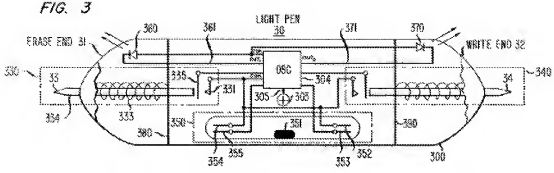

Fig. VII-8. Reproduction of Fig. 3 of Brown (U.S. Pat. 4,430,526). Tilt-sensitive switch 350 has mercury ball 351 that shorts contact pair 352 and 353 or contact pair 354 and 355 depending on the orientation of light pen 30. Note also the use of LEDs 360 and 370, switches 330 and 340, battery 303 and oscillator 304 in the pen. The invention of Burns requires no active components in the stylus, and with writing mode and imaging mode targets on corresponding ends of the stylus, it correctly detects the desired mode, independent of inclination.

G. A Combination of Omura, Ogawa and Inabata Does Not Teach, Show or Suggest the Claimed Invention

The Examiner has rejected claims 7 and 22 under U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538) as applied to claims 1 and 20 above, in further view of Inabata (U.S. Pat. 5,245,175). The Applicant believes that the Examiner is in error, because neither Omura nor Ogawa nor Inabata have "a single telemetric imager having an optical imaging array; a light source positioned near the telemetric imager to illuminate a stylus tip; and a controller electrically coupled to the telemetric imager; wherein the controller determines the stylus position based on a generated image of the stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region" as in currently pending claim 1 of Burns (Section VIII) or as in the original claim 1 of Burns (Section XI). Since claims 7 and 22 are dependent on claim 1 and corresponding method claim 20 of Burns, then for at least the reasons cited in Section VII-A and Section VII-B above, the rejection by the Examiner should be reversed.

H. A Combination of Omura, Ogawa and McDermott Does Not Teach, Show or Suggest the Claimed Invention

The Examiner has rejected claim 17 under U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538) as applied to claim 1 above, in further view of McDermott et al (U.S. Pat. 5,635,683). The Applicant asserts that the Examiner is in error, because neither Omura nor Ogawa nor McDermott have "a single telemetric imager having an optical imaging array; a light source positioned near the telemetric imager to illuminate a stylus tip; and a controller electrically coupled to the telemetric imager; wherein the controller determines the stylus position based on a generated image of the stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region" as in currently pending claim 1 of Burns (Section VIII) or as in the original claim 1 of Burns (Section XI). Since claim 17 is dependent on claim 1, then for at least the reasons cited in Section VII-A and Section VII-B above, the rejection by the Examiner should be reversed.

I. A Combination of Omura, Ogawa and Yoshida Does Not Teach, Show or Suggest the Claimed Invention

The Examiner has rejected claim 19 under U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538) as applied to claim 1 above, in further view of Yoshida et al (U.S. Pat. 5,401,917). The Applicant holds that the Examiner is in error, because neither Omura nor Ogawa nor Yoshida have "a single telemetric imager having an optical imaging array; a light source positioned near the telemetric imager to illuminate a stylus tip; and a controller electrically coupled to the telemetric imager; wherein the controller determines the stylus position based on a generated image of the stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region" as in currently pending claim 1 of Burns (Section VIII) or as in the original claim 1 of Burns (Section XI). Since claim 19 is dependent on claim 1, then for at least the reasons cited in Section VII-A and Section VII-B above, the rejection by the Examiner should be reversed.

J. A Combination of Omura, Ogawa and Badyal Does Not Teach, Show or Suggest the Claimed Invention

The Examiner has rejected claims 14, 24 and 33 under U.S.C. § 103(a) as being unpatentable over Omura (U.S. Pat. 6,594,023) and Ogawa (U.S. Pat. 6,100,538), in view of Badyal et al (U.S. Pat. 6,151,015). The Applicant disagrees with the Examiner, because neither Omura nor Ogawa nor Badyal have "a single telemetric imager having an optical imaging array; a light source positioned near the telemetric imager to illuminate a stylus tip; and a controller electrically coupled to the telemetric imager; wherein the controller determines the stylus position based on a generated image of the stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region" as in currently pending claim 1 of Burns (Section VIII) or as in the original claim 1 of Burns (Section XI).

For convenience, Fig. 1 of Badyal is reproduced below. Badyal should be discounted for several additional reasons: Badyal teaches that "the motion of tip 122 is detected by optical motion sensor IC 108 by comparing a newly captured image with a previously captured image to ascertain the direction and amount of movement" (col. 4, lines 14-20). Primarily, the Examiner seems to confuse the movement detection of Badyal with the position determination of Burns. Knowing where an object is going is not the same as knowing where it is. Badyal only knows where the object is going. Secondly, Badyal does not teach the generation of images from two different directions as in Burns. Badyal's optical motion sensor is in the stylus, and cannot generate images of itself. Thirdly, Badyal does not generate images of the stylus tip as in Burns, rather Badyal teaches that "the motion of the tip 122 is detected optically by optical motion sensor IC 108 by directly imaging, as an array of pixels, the various particular spatial features of a work surface below the tip" (col. 3, lines 62-65). Furthermore, Badyal teaches away from "generating images to determine stylus position" as in Burns, since the tip of Badyal's pen-like device is translucent (col. 3, lines 23-24 and claim element 3 of claim 1), and any attempt to generate images through its translucent material would provide milky, washed-out results. Fourthly, Badyal needs to continuously light up the surface in front of the pointing device, unlike Burns. Fifthly, Badyal has various types of

electronic devices in the stylus such as buttons, an integrated circuit, an illumination source, a power source, a communications link and an infrared detector, indicating that the approach of Badyal is significantly different from that of Burns.

Since claim 14 is dependent on claim 1, and since claim 24 is dependent on corresponding method claim 20, and since claim 33 is dependent on corresponding system claim 31, then for at least these reasons and other reasons as cited in Section VII-A and Section VII-B above, the rejections by the Examiner in both original and amended forms should be reversed.

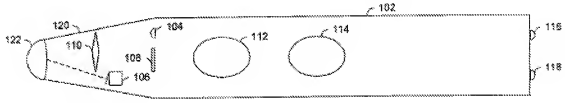

Fig. VII-9. Reproduction of Fig. 1 of Badyal (U.S. Pat. 6,151,015). Major components of a pen-like computer pointing device include a translucent tip 122, a lens 110, an optical motion sensing IC 108, an illumination source 104, a switch 106, buttons 112 and 114, a light-emitting diode 118 and an infrared detector 118 in a body 102. Badyal does not have a telemetric imager that generates images of a stylus tip and determines the position of the stylus tip based on the images, as does Burns. The simple stylus of Burns does not have the multitude of active elements like the pointing device of Badyal.

K. A Combination of Segen and Griffin Does Not Teach, Show or Suggest the Claimed Invention

The Examiner has rejected independent claim 40 under U.S.C. § 103(a) as being unpatentable over Segen (U.S. Pat. 5,484,966) in view of Griffin (U.S. Pat. 4,553,842). The Applicant believes that the Examiner is in error, because neither Segen nor Griffin has "a single telemetric imager having a single optical imaging array; a light source positioned near the telemetric imager to illuminate a stylus tip; and a controller electrically coupled to the telemetric imager; wherein the controller determines the stylus position based on a generated image of the stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region" as in claim 40 of Burns (Section VIII).

Claim 40, based on claim 1, was added after the previous rejection so that the Examiner's concerns could possibly be assuaged.

The Applicant contests the Examiner's rejection of claim 40 under U.S.C. § 103(a), since Segen does not have a telemetric imager having a single optical imaging array, nor does Segen determine a stylus position based on generated images of the stylus tip, nor does Segen disclose a light source positioned near the telemetric imager. Even the title of Segen's invention, "Sensing Stylus Position using Single 1-D Image Sensor" teaches away from the 3-D imaging approach of Burns. For example, a 1-D or linear image sensor would be unable to detect a single or double band near the tip of a stylus as in Burns. While Griffin has a light source, Griffin also has mirrors outlining a thin frame and a wildly whirring motor to spin a detector. The inventions of Griffin and Segen are clearly different from that of Burns, although not that much different from Omura and Ogawa in that the stylus is detected in a thin scanned planar region near the coordinate plane. Representative figures from Segen and Griffin are reproduced below for convenience.

It is clear to the Applicant that the invention of Burns is not the same as Segen or Griffin or any combination thereof, that neither Segen nor Griffin teaches, shows or suggests the invention as claimed by Burns, and that claim 40 should be allowed for at least these reasons and other reasons as cited in Section VII-A and Section VII-B above.

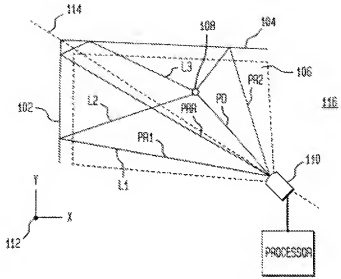

Fig. VII-10. Reproduction of Fig. 1 of Segen (U.S. Pat. 5,484,966). Reflective surfaces of mirrors 102 and 104 are substantially flat and are long enough to ensure that all reflections of a stylus 108, positioned in an active area 106, reach the sensing device 110. The height of the mirrors can be small because the viewing plane 116 defining the active area 106 is perpendicular to the reflecting surface of each mirror (Segen, col. 4, lines 19-25). The approach of Burns generates images of the stylus tip and determines the stylus position based on the images, eliminating the need for awkward and confining mirrors as in Segen.

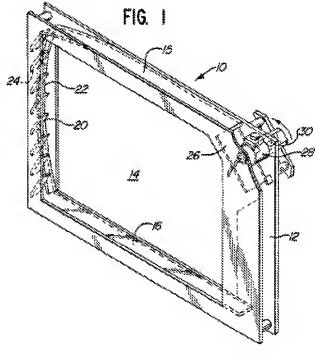

Fig. VII-11. Reproduction of Fig. 1 of Griffin (U.S. Pat. 4,553,842). This isometric view shows a retroreflector assembly 20 with a retroreflector strip 22 and a plurality of retroreflector elements 24 arranged in echelon adjacent to the retroreflector strip. A flat reflector 16 outlines the target zone 14 (Griffin, col. 3, lines 40-46). Detector assembly 28 has a drive motor that rotates a detector housing containing a lens, an aperture and a photodetector for scanning the target zone (Griffin, col. 4, lines 5-14). The approach of Griffin has substantially more parts and operates differently than Burns.

Summary and Conclusion

The Examiner has provided eleven separate grounds of rejection, of which all eleven have been argued against by the Appellant. In conclusion, none of the references of record, either alone or in combination, describe, anticipate, teach, show or suggest the claimed subject matter. For at least the above set forth reasons, the Applicant respectfully submits that all of the claims in the application define over and are neither anticipated nor made obvious by the cited art and that claims 1-40 herein fully satisfy the requirements of 35 U.S.C. §§ 102, 103 and 112 and are patentable over the references. The Applicant respectfully requests reversal of all rejections and prompt passage to issue of claims 1-40 (Section VIII) or preferably the original claims 1-39 (Section XI) and paid-up claim 40. If any questions remain that may be resolved through a personal or telephonic interview or if any of the contents of this Appeal Brief could be discussed, the Examiner or members of the Board are encouraged to contact the undersigned at the telephone number listed below.

Respectfully submitted,

/David W. Burns/

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VIII. Claims Appendix

As of the latest office action mailed on 10/31/06 (second and final rejection after filing an RCE on 6/7/06), claims 1-40 are pending in the application as listed below and all claims 1-40 currently stand rejected. Note that a listing of the claims as originally filed are listed in Section XI.

1 (Previously presented). A system for determining a stylus position of a stylus, the system comprising:

a single telemetric imager having an optical imaging array;

a light source positioned near the telemetric imager to illuminate a stylus tip; and

a controller electrically coupled to the telemetric imager;

wherein the controller determines the stylus position based on a generated image of the stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region.

2 (Original). The system of claim 1, wherein the stylus comprises one of a pen, a pencil, a pointer, or a marker.

3 (Original). The system of claim 1, wherein the stylus tip allows writing on a writable medium while the controller determines the stylus position.

4 (Original). The system of claim 1, wherein the stylus includes a writing-mode imaging target near a writing end of the stylus.

5 (Original). The system of claim 1, wherein the stylus includes an erasing-mode imaging target near an erasing end of the stylus.

6 (Original). The system of claim 1, wherein the telemetric imager comprises two optical imaging arrays to generate the image of the stylus tip from the first direction and the image of the stylus tip from the second direction when the stylus tip is in the stylus entry region.

7 (Original). The system of claim 1, wherein the telemetric imager comprises one optical imaging array to generate the image of the stylus tip from the first direction and the image of the stylus tip from the second direction when the stylus tip is in the stylus entry region.

8 (Original). The system of claim 1, wherein the stylus entry region comprises a writable medium.

9 (Original). The system of claim 8, wherein the writable medium comprises one of a sheet of paper or a pad of paper.

10 (Original). The system of claim 1 further comprising:

a writable medium positionable in the stylus entry region.

11 (Previously presented). The system of claim 1, wherein light emitted from the light source illuminates the stylus tip when the stylus tip is in the stylus entry region.

12 (Previously presented). The system of claim 1, wherein the light source is one of a modulatable light source or an unmodulatable light source.

13 (Previously presented). The system of claim 1, wherein the light source is selected from the group consisting of a light-emitting diode, a laser diode, an infrared light-emitting diode, an infrared laser, a visible laser, an ultraviolet light-emitting diode, an ultraviolet laser, a light bulb, and a light-emitting device.

14 (Previously presented). The system of claim 1, wherein the light source positioned near the telemetric imager is controllable;

wherein a first set of images of the stylus tip from the first direction and the second direction are generated with the light source on, and wherein a second set of images of the stylus tip from the first direction and the second direction are generated with the light source off; and

wherein the first set of images and the second set of images are compared to determine the stylus position.

15 (Original). The system of claim 1 further comprising:

an optical filter positioned between the telemetric imager and the stylus tip;

wherein the optical filter preferentially passes light from the stylus tip to the telemetric imager.

16 (Original). The system of claim 1 further comprising:

a communication port connected to the controller to enable communication between the controller and a digital computing device.

17 (Original). The system of claim 16, wherein the communication port is one of a wired port or a wireless port.

18 (Previously presented). The system of claim 1 further comprising:

a housing;

wherein the telemetric imager and the controller are contained in the housing; and

wherein the light source is coupled to the housing.

19 (Original). The system of claim 18 further comprising:

at least one stylus holder formed within the housing;

wherein the stylus holder receives the stylus for stylus storage.

20 (Previously presented). A method of determining a stylus position, the method comprising:

positioning a stylus tip of a stylus in a stylus entry region;

generating an image of the stylus tip from a first direction with a single telemetric imager;

generating an image of the stylus tip from a second direction with the telemetric imager; and

determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region;

wherein the stylus tip of the stylus is illuminated by a light source positioned near the telemetric imager.

21 (Original). The method of claim 20, wherein the image of the stylus tip from the first direction is generated with a first optical imaging array and the image of the stylus tip from the second direction is generated with a second optical imaging array.

22 (Original). The method of claim 20, wherein the image of the stylus tip from the first direction and the image of the stylus tip from the second direction are generated with one optical imaging array.

23 (Previously presented). The method of claim 20 further comprising:

illuminating the stylus tip with the light source when the stylus tip is in the stylus entry region.

24 (Previously presented). The method of claim 20 further comprising:

turning on the light source to illuminate the stylus tip;

generating a first set of images of the stylus tip from the first direction and from the second direction;

turning off the light source;

generating a second set of images of the stylus tip from the first direction and from the second direction;

comparing the first set of generated images with the second set of generated images; and

determining the stylus position based on the comparison.

25 (Original). The method of claim 20 further comprising:

determining one of a writing mode or an erasing mode when the stylus tip is in the stylus entry region.

26 (Original). The method of claim 20 further comprising:

determining a stylus angle of the stylus when the stylus tip is in the stylus entry region.

27 (Original). The method of claim 20 further comprising:

determining a stylus rotation of the stylus when the stylus tip is in the stylus entry region.

28 (Original). The method of claim 20 further comprising:

writing on a writable medium with the stylus tip when the stylus tip is in the stylus entry region.

29 (Original). The method of claim 20 further comprising:

sending the determined stylus position to a digital computing device.

30 (Original). The method of claim 20 further comprising:

interpreting the determined stylus position.

31 (Previously presented). A system for determining a position of a stylus in a stylus entry region, the system comprising:

means for illuminating a stylus tip with a light source when the stylus tip is in the stylus entry region;

means for generating an image of the stylus tip from a first direction with a single telemetric imager;

means for generating an image of the stylus tip from a second direction with the telemetric imager; and

means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region.

32 (Previously presented). The system of claim 31 further comprising:

means for illuminating the stylus tip with the light source when the stylus tip is in the stylus entry region.

33 (Previously presented). The system of claim 31 further comprising:

means for turning on the light source to illuminate the stylus tip;

means for generating a first set of images of the stylus tip from the first direction and from the second direction;

means for turning off the light source;

means for generating a second set of images of the stylus tip from the first direction and from the second direction;

means for comparing the first set of generated images with the second set of generated images; and

means for determining the stylus position based on the comparison.

34 (Original). The system of claim 31 further comprising:

means for determining one of a writing mode or an erasing mode when the stylus tip is in the stylus entry region.

35 (Original). The system of claim 31 further comprising:

means for determining a stylus angle of the stylus when the stylus tip is in the stylus entry region.

36 (Original). The system of claim 31 further comprising:

means for determining a stylus rotation of the stylus when the stylus tip is in the stylus entry region.

37 (Original). The system of claim 31 further comprising:

means for writing on a writable medium with the stylus tip when the stylus tip is in the stylus entry region.

38 (Original). The system of claim 31 further comprising:

means for sending the determined stylus position to a digital computing device.

39 (Original). The system of claim 31 further comprising:

means for interpreting the determined stylus position.

40 (Previously added). A system for determining a stylus position of a stylus, the system comprising:

a single telemetric imager having a single optical imaging array;

a light source positioned near the telemetric imager to illuminate a stylus tip; and

a controller electrically coupled to the telemetric imager;

wherein the controller determines the stylus position based on a generated image of the stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region.

IX. Evidence Appendix

Evidence supporting the arguments in this brief are found in the Examiner's office actions, the responses by the Applicant, and the references cited therein.

X. Related Proceedings Appendix

There are no related proceedings known to the Appellant.

XI. Listing of Claims as Originally Filed and as Currently Desired

The claims as originally filed are listed below. Note that a listing of the pending claims as of the latest office action of 10/31/06 may be found in Section VIII.

What is claimed is:

1 (Original). A system for determining a stylus position of a stylus, the system comprising:

a telemetric imager; and

a controller electrically coupled to the telemetric imager;

wherein the controller determines the stylus position based on a generated image of a stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region.

2 (Original). The system of claim 1, wherein the stylus comprises one of a pen, a pencil, a pointer, or a marker.

3 (Original). The system of claim 1, wherein the stylus tip allows writing on a writable medium while the controller determines the stylus position.

4 (Original). The system of claim 1, wherein the stylus includes a writing-mode imaging target near a writing end of the stylus.

5 (Original). The system of claim 1, wherein the stylus includes an erasing-mode imaging target near an erasing end of the stylus.

6 (Original). The system of claim 1, wherein the telemetric imager comprises two optical imaging arrays to generate the image of the stylus tip from the first direction and the image of the stylus tip from the second direction when the stylus tip is in the stylus entry region.

7 (Original). The system of claim 1, wherein the telemetric imager comprises one optical imaging array to generate the image of the stylus tip from the first direction and the image of the stylus tip from the second direction when the stylus tip is in the stylus entry region.

8 (Original). The system of claim 1, wherein the stylus entry region comprises a writable medium.

9 (Original). The system of claim 8, wherein the writable medium comprises one of a sheet of paper or a pad of paper.

10 (Original). The system of claim 1 further comprising:

a writable medium positionable in the stylus entry region.

11 (Original). The system of claim 1 further comprising:

a light source positioned near the telemetric imager;

wherein light emitted from the light source illuminates the stylus tip when the stylus tip is in the stylus entry region.

12 (Original). The system of claim 11, wherein the light source is one of a modulatable light source or an unmodulatable light source.

13 (Original). The system of claim 11, wherein the light source is selected from the group consisting of a light-emitting diode, a laser diode, an infrared light-emitting diode, an infrared laser, a visible laser, an ultraviolet light-emitting diode, an ultraviolet laser, a light bulb, and a light-emitting device.

14 (Original). The system of claim 1 further comprising:

a controllable light source positioned near the telemetric imager;

wherein a first set of images of the stylus tip from the first direction and the second direction are generated with the light source on, and wherein a second set of images of the stylus tip from the first direction and the second direction are generated with the light source off; and

wherein the first set of images and the second set of images are compared to determine the stylus position.

15 (Original). The system of claim 1 further comprising:

an optical filter positioned between the telemetric imager and the stylus tip;

wherein the optical filter preferentially passes light from the stylus tip to the telemetric imager.

16 (Original). The system of claim 1 further comprising:

a communication port connected to the controller to enable communication between the controller and a digital computing device.

17 (Original). The system of claim 16, wherein the communication port is one of a wired port or a wireless port.

18 (Original). The system of claim 1 further comprising:

a housing;

wherein the telemetric imager and the controller are contained in the housing.

19 (Original). The system of claim 18 further comprising:

at least one stylus holder formed within the housing;

wherein the stylus holder receives the stylus for stylus storage.

20 (Original). A method of determining a stylus position, the method comprising:

positioning a stylus tip of a stylus in a stylus entry region;

generating an image of the stylus tip from a first direction;

generating an image of the stylus tip from a second direction; and

determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region.

21 (Original). The method of claim 20, wherein the image of the stylus tip from the first direction is generated with a first optical imaging array and the image of the stylus tip from the second direction is generated with a second optical imaging array.

22 (Original). The method of claim 20, wherein the image of the stylus tip from the first direction and the image of the stylus tip from the second direction are generated with one optical imaging array.

23 (Original). The method of claim 20 further comprising:

illuminating the stylus tip with a light source when the stylus tip is in the stylus entry region.

24 (Original). The method of claim 20 further comprising:

turning on a light source to illuminate the stylus tip;

generating a first set of images of the stylus tip from the first direction and from the second direction;

turning off the light source;

generating a second set of images of the stylus tip from the first direction and from the second direction;

comparing the first set of generated images with the second set of generated images; and

determining the stylus position based on the comparison.

25 (Original). The method of claim 20 further comprising:

determining one of a writing mode or an erasing mode when the stylus tip is in the stylus entry region.

26 (Original). The method of claim 20 further comprising:

determining a stylus angle of the stylus when the stylus tip is in the stylus entry region.

27 (Original). The method of claim 20 further comprising:

determining a stylus rotation of the stylus when the stylus tip is in the stylus entry region.

28 (Original). The method of claim 20 further comprising:

writing on a writable medium with the stylus tip when the stylus tip is in the stylus entry region.

29 (Original). The method of claim 20 further comprising:

sending the determined stylus position to a digital computing device.

30 (Original). The method of claim 20 further comprising:

interpreting the determined stylus position.

31 (Original). A system for determining a stylus position, the system comprising:

means for positioning a stylus tip of a stylus in a stylus entry region;

means for generating an image of the stylus tip from a first direction;

means for generating an image of the stylus tip from a second direction; and

means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region.

32 (Original). The system of claim 31 further comprising:

means for illuminating the stylus tip with a light source when the stylus tip is in the stylus entry region.

33 (Original). The system of claim 31 further comprising:

means for turning on a light source to illuminate the stylus tip;

means for generating a first set of images of the stylus tip from the first direction and from the second direction;

means for turning off the light source;

means for generating a second set of images of the stylus tip from the first direction and from the second direction;

means for comparing the first set of generated images with the second set of generated images; and

means for determining the stylus position based on the comparison.

34 (Original). The system of claim 31 further comprising:

means for determining one of a writing mode or an erasing mode when the stylus tip is in the stylus entry region.

35 (Original). The system of claim 31 further comprising:

means for determining a stylus angle of the stylus when the stylus tip is in the stylus entry region.

36 (Original). The system of claim 31 further comprising:

means for determining a stylus rotation of the stylus when the stylus tip is in the stylus entry region.

37 (Original). The system of claim 31 further comprising:

means for writing on a writable medium with the stylus tip when the stylus tip is in the stylus entry region.

38 (Original). The system of claim 31 further comprising:

means for sending the determined stylus position to a digital computing device.

39 (Original). The system of claim 31 further comprising:

means for interpreting the determined stylus position.